

REMARKS

Claims 1-13 are pending in the present application.

In the Office Action, claims 1-13 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Harrison (U.S. Patent No. 6,154,485) in view of Forssen (U.S. Patent No. 6,173,014). The Examiner's rejections are respectfully traversed.

Claim 1 sets forth a method of transmitting signals from at least two antennae. The claimed method includes the steps of determining at least one correlation coefficient between signals received by the at least two antennae and, in response to the at least one determined correlation coefficient, selecting at least one of orthogonal coding and beamforming for transmitting signals using the at least two antennae. Figure 1 depicts one exemplary embodiment of a system 8 that may implement the claimed method. The system 8 includes two transmit antennae 24, 26. A space-time encoder 12 may be used to compute correlation coefficients that can be used to control relative amounts of beamforming and orthogonal coding. See Patent Application, page 6, line 18 – page 12, line 14 and Figures 1-2.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. That is, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561 (Fed. Cir. 1986). Third, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of

success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); M.P.E.P. § 2142. A recent Federal Circuit case emphasizes that, in an obviousness situation, the prior art must disclose each and every element of the claimed invention, and that any motivation to combine or modify the prior art must be based upon a suggestion in the prior art. *In re Lee*, 61 U.S.P.Q.2d 143 (Fed. Cir. 2002). Conclusory statements regarding common knowledge and common sense are insufficient to support a finding of obviousness. *Id.* at 1434-35.

Harrison is concerned with receiving signals using combined orthogonal transmit diversity and adaptive array techniques. Harrison describes a coefficient α that may be used to calculate adaptive array filter weights 90 and 92, which may be used by an adaptive array processor 76 to allow a base transmitter to transition between an orthogonal transmit diversity mode and an adaptive array mode in proportion to degradation in the quality of feedback data. This transition may allow the base transmitter to disable the adaptive array mode in proportion to the degradation of the quality of feedback data from a receiver. See Harrison, col. 8, ll. 23-35.

In this Office Action and the previous Office Actions, the Examiner alleged that the coefficient α described in Harrison is a correlation coefficient. In particular, the Examiner alleges that the coefficient α is a correlation coefficient because the manner in which the coefficient α is used may affect the correlation of signals transmitted by the antenna described in Harrison. Applicants respectfully maintain their position that the term "correlation coefficient" has a specific meaning that is well understood by persons of ordinary skill in the art and that persons of ordinary skill in the art would interpret the term "correlation coefficient" to refer to a well-known statistical quantity that represents the degree to which distributions of two or more quantities are linearly associated. The Examiner has provided no evidence to contradict this

position or to demonstrate that a person of ordinary skill in the art would refer to the coefficient α described in Harrison as a correlation coefficient.

Forssen describes estimating the correlation of impairments associated with the signals received at different antennas. The impairment of a signal is defined as the combination of the interference plus the noise in a signal received at an antenna. The impairment of signals provided by a single source that travel along different paths and are received at two closely spaced antennas should be correlated, so estimates of the impairment correlation may permit the interference and the noise in a signal to be estimated and removed. See Forssen, col. 4, ll. 37-56. For example, a branch metric processor 550 may use estimates of the impairment correlation properties to improve branch metric formulations. See Forssen, col. 7, ll. 12-25.

The Examiner then alleges that it would be obvious to modify Harrison so that the coefficient α is determined based on the impairment correlation described by Forssen. Applicants respectfully disagree and submit that the prior art of record contains no suggestion or motivation for the Examiner's proposed modifications. As discussed above, Harrison is concerned with adjusting a transmission mode based upon degradation in feedback data, *e.g.*, a received signal. In contrast, Forssen is concerned with improving the quality of the received signal using impairment correlation properties of the interference and/or noise in the received signal. However, Forssen provides no teaching or suggestion that the impairment correlation in the received signal is in any way related to the preferred mode of transmission of a signal. Harrison is also completely silent with regard to using correlations of portions of the received signal to determine the coefficient α and, in particular, for using the impairment correlation described by Forssen to determine the coefficient α . Consequently, Applicants respectfully

submit that the cited references fail to provide any suggestion or motivation for modifying the prior art of record to arrive at the subject matter set forth in the pending claims.

Furthermore, even if the subject matter described by Harrison and Forssen were combined in the manner suggested by the Examiner, Applicants respectfully submit that the cited references have provided no teaching or suggestion that the proposed combination would achieve the goal stated by the Examiner. In particular, the Examiner alleged that the proposed combination (*i.e.*, using the impairment correlation to determine the coefficient α) would allow the value of the coefficient α to be adjusted to aid in the transmission of signals. However, as discussed above, neither Harrison nor Forssen teaches that the impairment correlation in the received signal is in any way related to the preferred mode of transmission of a signal. Accordingly, Applicants respectfully submit that the cited references fail to provide a reasonable expectation that the proposed combination would be successful. In particular, neither Harrison nor Forssen provides a reasonable expectation that using the impairment correlation to determine the coefficient α would allow the value of the coefficient α to be adjusted to aid in the transmission of signals.

For at least the aforementioned reasons, Applicants respectfully submit that the Examiner has failed to make a *prima facie* case that the present invention is obvious over the cited references and requests that the Examiner's rejections of claims 1-13 under 35 U.S.C. § 103(a) be withdrawn.

For the aforementioned reasons, it is respectfully submitted that all claims pending in the present application are in condition for allowance. The Examiner is invited to contact the undersigned at (713) 934-4052 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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